ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY TITLE V PERMIT

COMPANY: Yarnell Mining Company
FACILITY: Gold Mine
Permit No.: 1000383
DATE ISSUED: DRAFT
EXPIRY DATE:

SUMMARY

This Class I, unitary permit is issued to the Yarnell Mining Company, a subsidiary of Bema Gold (U.S.), Inc. (permittee) for the development and operation of an open-pit, gold mining operation. The Yarnell project site is situated one-half mile south of the town of Yarnell and one-quarter mile southeast of the Glen Ilah subdivision, as measured from the northwest boundary of the proposed project area to the southern boundaries of Glen Ilah and Yarnell. The project will consist of the open-pit mine, two waste rock areas, ore crushers, a heap leach pad, process ponds, an assay laboratory and a gold refinery plant. Electric power for the project will be provided by line power or by diesel powered generators with approximately 1,200 kilowatt capacity.

Drilling and blasting will occur in the pit, and the resulting ore and waste rock will be removed. Waste rock from the pit will be transported by haul trucks to two waste rock storage areas. Ore will be hauled to a stationary crushing facility, crushed to 80 percent minus 1½ inch size and mixed with lime. The crushed ore will be hauled to a conventional leach pad where a dilute sodium cyanide solution will be percolated through the ore for leaching. Gold will be recovered by carbon adsorption and stripping and refined by electrowinning and a doré furnace. Molten bullion will be cast into doré bars. Mining, ore processing, waste rock storage, heap leaching and associated operations and support activities at the mining site will be sources of air pollutants. The principal pollutants will be particulate matter less than 10 micrometers in diameter (PM_{10}), oxides of nitrogen (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2) and volatile organic compounds (VOCs). The mine also has the potential to emit small quantities of hydrogen cyanide (HCN) and mercury (Hg).

All of these pollutants are regulated under Arizona and federal law with standards and guidelines that specify emission controls, emission limits and/or allowable ambient, off-site impacts of the pollutants. The estimated, maximum, total emissions from this project were determined as shown in Table 1. These estimates are based on the installation, operation and maintenance of the required controls and other permit requirements summarized in Table 2.

Table 1 - Estimated Emissions

Summary of Controlled Emissions							
Pollutants	PM_{10}	NO_x	CO	SO_2	VOCs	HCN	Hg
Emissions, pounds/day							
Process	249	609	202	13.9	28.0	0.0	0.088
Non-Process	927	320	1260	37.6	2.7	26.7	0.000
Total	1,176	929	1,462	51.5	30.7	26.7	0.088
Annual Emissions, tons/year							
Process	11.5	111.0	36.9	2.5	5.1	0.0	0.0083
Non-Process	71.5	16.6	65.2	1.9	0.5	4.86	0.0000
Total	83.0	127.6	102.1	4.4	5.6	4.86	0.0083

Table 2 - Summary of Permit Requirements

Emission Unit	Specie Emitted	Control Measure/ PM_{10} Control Efficiency	Emission Limit Opacity Standard (1)	Recordkeeping	Reporting
Drilling	PM_{10}	water injection, pneumatic flushing and/or dust shroud/85%	opacity ≤ 40%	compliance with Operation and Maintenance (O and M) Plan	semi-annual, summary report of recordkeeping requirements except for performance test results
Haul Roads	PM_{10}	water/chemical application/90%	opacity ≤ 40%	record date, time, intensity and roadway designation for both suppressant and water applications	
Off-road Machinery	SO_2, PM	0.05 percent or less sulfur content in diesel No. 2 fuel	opacity ≤ 40%	record the sulfur content of fuel burned per vendor specification	
Generators	SO_2, PM	0.05 percent or less sulfur content in diesel No. 2 fuel	opacity ≤ 40%; $E = 1.02\ Q^{0.769}$ (2); $SO_2 \leq 1$ lb/MMBtu	record the sulfur content of fuel burned per vendor specification	
Carbon Kiln	Hg, PM_{10}	baghouse/98% for PM_{10}; 90% for Hg	opacity ≤ 40%; $E = 4.10\ Q^{0.67}$ (2); $SO_2 \leq 600$ ppm; $NO_x \leq 500$ ppm	results of performance test for PM_{10}	results of performance test for PM_{10} within 30 days after testing is performed
Doré Furnace	Hg, PM_{10}				
Primary Crusher Secondary Crusher	PM_{10}	high pressure water sprays or equivalent/90%	opacity ≤ 10%;	secondary crusher performance test results	
				record ore processed and hours of operation, daily/monthly	semi-annual, summary report of recordkeeping requirements except for performance test results
				compliance with O and M Plan	
Ore Conveyor	PM_{10}	water sprays/83%	opacity ≤ 10%	compliance with O and M Plan	
Lime Silo	PM_{10}	fabric filter/99%	opacity ≤ 40%	compliance with O and M Plan	
Waste Dump Erosion	PM_{10}	water or chemical suppressant application/90%	opacity ≤ 40%	for water, record of date, time, intensity and pile designation	
Ore Storage Erosion	PM_{10}	water or chemical suppressant application/90%	opacity ≤ 40%	for water, record of date, time, intensity and pile designation	
Leach Pad	HCN	drip emitters; spray bars; pH control	HCN ≤ 0.3 ppmv, 8-hour avg.	measure and record pH value daily	
	NaCN	proper storage	NaCN ≤ 140 µg/m^3, 8-hour avg.	record of date of deliveries and the method of containment as delivered and stored	

Notes: (1) Measurement methods are: EPA Reference Method 5 for PM/PM_{10} mass emission rate; Method 9 for opacity; Method 6 for SO_2: and Method 7 for NO_x.
(2) E = pounds per hour; Q = heat input in MMBtu per hour.

ABBREVIATIONS

$\mu g/m^3$	microgram per cubic meter
A.A.C.	Arizona Administrative Code
A.R.S.	Arizona Revised Statutes
ADEQ	Arizona Department of Environmental Quality
CO	carbon monoxide
dscf	standard cubic foot, dry
EPA	Environmental Protection Agency
g/scm	grams per standard cubic meter
HCN	hydrogen cyanide
Hg	mercury
kW	kilowatt
NaCN	sodium cyanide
NO_x	oxides of nitrogen
pH	the negative logarithm (base 10) of the hydrogen ion concentration of the solution
PM	particulate matter
PM_{10}	Particulate matter with an aerodynamic diameter less than or equal to ten micrometers
ppmv	parts per million by volume
scfm	standard cubic feet per minute
SO_2	sulphur dioxide
TPH	tons per hour
VOC	volatile organic compounds

ATTACHMENT "A": GENERAL PROVISIONS
Air Quality Control Permit No. 1000383
For
Yarnell Mining Company

I. PERMIT EXPIRATION AND RENEWAL [A.R.S. § 49-426.F, A.A.C. R18-2-304.C.2 and 306.A.1]

A. This permit is valid for a period of five years from the date of issuance of the permit.

B. The Permittee shall submit an application for renewal of this permit at least 6 months, but not more than 18 months prior to the date of permit expiration.

II. COMPLIANCE WITH PERMIT CONDITIONS [A.A.C. R18-2-306.A.8]

A. The Permittee shall comply with all conditions of this permit including all applicable requirements of Arizona air quality statutes and the air quality rules. Any permit noncompliance constitutes a violation of the Arizona Revised Statutes and is grounds for enforcement action; for permit termination, revocation and reissuance, or revision; or for denial of a permit renewal application. In addition, noncompliance with any federally enforceable requirement constitutes a violation of the Clean Air Act.

B. Need to halt or reduce activity not a defense. It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

III. PERMIT REVISION, REOPENING, REVOCATION AND REISSUANCE, OR TERMINATION FOR CAUSE [A.A.C. R18-2-306.A.8.c, 321]

A. The permit may be revised, reopened, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a permit revision, revocation and reissuance, or termination; or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.

B. The permit shall be reopened and revised under any of the following circumstances:

1. Additional applicable requirements under the Act become applicable to the Class I source. Such reopening shall only occur if there are three or more years remaining in the permit term. The reopening shall be completed not later than 18 months after promulgation of the applicable requirement. No such reopening is required if the effective date of the requirement is later than the date on which the permit is due to expire, unless the original permit or any of its terms and conditions has been extended pursuant to R18-2-322(B). Any permit revision required pursuant to this subparagraph shall comply with provisions in R18-2-322 for permit renewal and shall reset the five year permit term.

2. Additional requirements, including excess emissions requirements, become applicable to an affected source under the acid rain program. Upon approval by the Administrator, excess emissions offset plans shall be deemed to be incorporated into the Class I permit.

3. The Director or the Administrator determines that the permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of the permit.

4. The Director or the Administrator determines that the permit needs to be revised or revoked to assure compliance with the applicable requirements.

C. Proceedings to reopen and issue a permit, including appeal of any final action relating to a permit reopening, shall follow the same procedures as apply to initial permit issuance and shall, except for reopenings under paragraph 1 above, affect only those parts of the permit for which cause to reopen exists. Such reopenings shall be made as expeditiously as practicable. Permit reopenings for reasons other than those stated in paragraph III.B.1 of this Attachment shall not result in a resetting of the five year permit term.

IV. POSTING OF PERMIT [A.A.C. R18-2-315]

A. Permittee shall post such permit, or a certificate of permit issuance on location where the equipment is installed in such a manner as to be clearly visible and accessible. All equipment covered by the permit shall be clearly marked with one of the following:

1. Current permit number.

2. Serial number or other equipment number that is also listed in the permit to identify that piece of equipment.

B. A copy of the complete permit shall be kept on the site.

V. FEE PAYMENT [A.A.C. R18-2-326, 306.A.9.]

Permittee shall pay fees to the Director pursuant to A.R.S. § 49-426(E) and A.A.C. R18-2-326.

VI. ANNUAL EMISSIONS INVENTORY QUESTIONNAIRE [A.A.C. R18-2-327]

A. Permittee shall complete and submit to the Director an annual emissions inventory questionnaire. The questionnaire is due by March 31 or ninety days after the Director makes the inventory form available each year, whichever occurs later, and shall include emission information for the previous calendar year.

B. The questionnaire shall be on a form provided by the Director and shall include the information required by A.A.C. R18-2-327.

VII. COMPLIANCE CERTIFICATION [A.A.C. R18-2-309.2.c, 306.A.5]

A. Permittee shall submit a compliance certification to the Director twice each year, which describes the compliance status of the source with respect to each permit condition. The first certification shall be submitted no later than April 15th, and shall report the compliance status of the source during the period between September 16th of the previous year, and March 15th of the current year. The second certification shall be submitted no later than October 15th, and shall report the compliance status of the source during the period between March 16th and September 15th of the current year.

The compliance certifications shall include the following:

1. Identification of each term or condition of the permit that is the basis of the certification;

2. Compliance status of each applicable requirement;

3. Whether compliance was continuous or intermittent;

4. Method(s) used for determining the compliance status of the source, currently and over the reporting period;

5. All instances of deviations from permit requirements reported pursuant to Section XI.B of this Attachment; and

6. A progress report on all outstanding compliance schedules submitted pursuant to Section XI.C of this Attachment.

B. A copy of all compliance certification for Class I permits shall also be submitted to the EPA Administrator.

VIII. CERTIFICATION OF TRUTH, ACCURACY AND COMPLETENESS [A.A.C. R18-2-309.3]

Any document required to be submitted by this permit, including reports, shall contain a certification by a responsible official of truth, accuracy, and completeness. This certification and any other certification required under this part shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

IX. INSPECTION AND ENTRY [A.A.C. R18-2-309.4]

The Permittee shall allow the Director or the authorized representative of the Director upon presentation of proper credentials to:

A. Enter upon the Permittee's premises where a source is located or emissions-related activity is conducted, or where records are required to be kept under the conditions of the permit;

B. Have access to and copy, at reasonable times, any records that are required to be kept under the conditions of the permit;

C. Inspect, at reasonable times, any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit;

D. Sample or monitor, at reasonable times, substances or parameters for the purpose of assuring compliance with the permit or other applicable requirements; and

E. Record any inspection by use of written, electronic, magnetic and photographic media.

X. PERMIT REVISION PURSUANT TO FEDERAL HAZARDOUS AIR POLLUTANT STANDARD [A.A.C. R18-2-304.C]

If this source becomes subject to a standard promulgated by the Administrator pursuant to section 112(d) of the Act, then the Permittee shall, within twelve months of the date on which the standard is promulgated, submit an application for a permit revision demonstrating how the source will comply with the standard.

XI. PERMIT DEVIATION REPORTING

A. EXCESS EMISSIONS REPORTING [A.A.C. R18-2-306.A.5.b, 306.E.3.d]

1. Emissions in excess of an applicable emission limitation contained in Section I of Attachment "B", of this permit shall constitute a violation. For all situations that constitute an emergency as defined in R18-2-306(E), the affirmative defense and reporting requirements contained in that provision shall apply.

2. It shall be the burden of the Permittee to demonstrate, through submission of the data and information required by this section, that all reasonable and practicable measures within the Permittee's control were implemented to prevent the occurrence of excess emissions.

3. Excess emissions shall be reported as follows:

   a. The Permittee shall report to the Director any emissions in excess of the limits established by this permit. Such report shall be in two parts as specified below:

      (1) Notification by telephone or facsimile within 24 hours of the time when the Permittee first learned of the occurrence of excess emissions including all available information from paragraph b. of this subsection.

      (2) Detailed written notification within 72 hours of the notification pursuant to subparagraph (1) of this paragraph.

   b. Report shall contain the following information:

      (1) Identity of each stack or other emission point where the excess emissions occurred.

      (2) Magnitude of the excess emissions expressed in the units of the applicable emission limitation and the operating data and calculations used in determining the magnitude of the excess emissions.

      (3) Date, time and duration or expected duration of the excess emissions.

      (4) Identity of the equipment from which the excess emissions emanated.

      (5) Nature and cause of such emissions.

      (6) If the excess emissions were the result of a malfunction, steps taken to remedy the malfunction and the steps taken or planned to prevent the recurrence of such malfunctions.

      (7) Steps taken to limit the excess emissions. If the source's permit contains procedures governing source operation during periods of start-up or malfunction and the excess emissions resulted from start-up or malfunction, the report shall contain a list of the steps taken to comply with the permit procedures.

4. In the case of continuous or recurring excess emissions, the notification requirements of this section shall be satisfied if the source provides the required notification after excess emissions are first detected and includes in such notification an estimate of the time the excess emissions will continue. Excess emissions occurring after the estimated time period or changes in the nature of the emissions as originally reported shall require additional notification pursuant to subsection A.3.a.(2) of this Section.

5. EMERGENCY PROVISION [A.A.C. R18-2-306.E]

a. An "emergency" means any situation arising from sudden and reasonably unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under the permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

b. An emergency constitutes an affirmative defense to an action brought for noncompliance with such technology-based emission limitations if the conditions of paragraph d of this section are met.

c. The Permittee shall submit notice of the emergency to the Director by certified mail, facsimile or hand delivery within 2 working days of the time when emission limitations were exceeded due to an emergency. This notice shall contain a description of the emergency, any steps taken to mitigate emissions, and corrective action taken.

d. The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An emergency occurred and that the Permittee can identify the cause(s) of the emergency;

(2) The permitted facility was at the time being properly operated;

(3) During the period of the emergency the Permittee took all reasonable steps to minimize levels of emissions that exceeded the emissions standards or other requirements in the permit; and

(4) The notice was submitted per paragraph c. above.

e. In any enforcement proceeding, the Permittee seeking to establish the occurrence of an emergency has the burden of proof.

f. This provision is in addition to any emergency or upset provision contained in any applicable requirement.

B. OTHER PERMIT DEVIATIONS [A.A.C. R18-2-306.A.5 and 6, 306.E.3.d.]

Permittee shall promptly report deviations from permit requirements, including those attributable to upset conditions as defined in the permit, the probable cause of such deviations, and any corrective actions or preventive measures taken. Prompt reporting shall mean that the report was submitted to the Director by certified mail, facsimile, or hand delivery within two working days of the time the deviation occurred.

C. For any episode of non-compliance that is reported pursuant to XI.A and XI.B above, and that cannot be corrected within 72 hours, the Permittee is required to submit a compliance schedule to the Director within 21 days of such occurrence. The compliance schedule shall include a schedule of remedial measures, including an enforceable sequence of actions with milestones, leading to compliance with the permit terms or conditions that have been violated.

XII. RECORD KEEPING REQUIREMENTS [A.A.C. R18-2-306.A.4]

A. Permittee shall keep records of all required monitoring information including, but not limited to, the following:

1. The date, place as defined in the permit, and time of sampling or measurements;

2. The date(s) analyses were performed;

3. The name of the company or entity that performed the analyses;

4. A description of the analytical techniques or methods used;

5. The results of such analyses; and

6. The operating conditions as existing at the time of sampling or measurement.

B. Permittee shall retain records of all required monitoring data and support information for a period of at least 5 years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit.

XIII. REPORTING REQUIREMENTS [A.A.C. R18-2-306.A.5.a]

Permittee shall submit the following reports :

1. Compliance certifications in accordance with Section VII of Attachment "A".
2. Permit deviation reports in accordance with Section XI of Attachment "A".
3. Other reports required by Section III of Attachment "B".

XIV. DUTY TO PROVIDE INFORMATION [A.A.C. R18-2-304.G and 306.A.8.e]

A. The Permittee shall furnish to the Director, within a reasonable time, any information that the Director may request in writing to determine whether cause exists for revising, revoking and reissuing, or terminating the permit or to determine compliance with the permit. Upon request, the Permittee shall also furnish to the Director copies of records required to be kept by the permit. For information claimed to be confidential, the Permittee shall furnish an additional copy of such records directly to the Administrator along with a claim of confidentiality.

B. If the Permittee has failed to submit any relevant facts or if the Permittee has submitted incorrect information in the permit application, the Permittee shall, upon becoming aware of such failure or incorrect submittal, promptly submit such supplementary facts or corrected information.

XV. PERMIT AMENDMENT OR REVISION [A.A.C. R18-2-318, 319 and 320]

Permittee shall apply for a permit amendment or revision for changes to the facility which do not qualify for a facility change without revision under Section XVI, as follows:

A. Administrative Permit Amendment (A.A.C. R18-2-318);

B. Minor Permit Revision (A.A.C. R18-2-319);

C. Significant Permit Revision (A.A.C. R18-2-320).

The applicability and requirements for such action are defined in the above referenced regulations.

XVI. FACILITY CHANGE WITHOUT PERMIT REVISION [A.A.C. R18-2-317]

A. Permittee may make changes at the permitted source without a permit revision if all of the following apply:

1. The changes are not modifications under any provision of Title I of the Act or under A.R.S. § 49-401.01(17).

2. The changes do not exceed the emissions allowable under the permit whether expressed therein as a rate of emissions or in terms of total emissions.

3. The changes do not violate any applicable requirements or trigger any additional applicable requirements.

4. The changes satisfy all requirements for a minor permit revision under R18-2-319(A).

5. The changes do not contravene federally enforceable permit terms and conditions that are monitoring (including test methods), recordkeeping, reporting, or compliance certification requirements.

B. The substitution of an item of process or pollution control equipment for an identical or substantially similar item of process or pollution control equipment shall qualify as a change that does not require a permit revision, if it meets all of the requirements of subsections (A) and (C) of this Section.

C. For each such change under subsections A and B of this Section, a written notice by certified mail or hand delivery shall be received by the Director and, for Class I permits, the Administrator, a minimum of 7 working days in advance of the change. Notifications of changes associated with emergency conditions, such as malfunctions necessitating the replacement of equipment, may be provided less than 7 working days in advance of the change but must be provided as far in advance of the change as possible or, if advance notification is not practicable, as soon after the change as possible. Each notification shall include:

a. When the proposed change will occur.

b. A description of each such change.

c. Any change in emissions of regulated air pollutants.

d. The pollutants emitted subject to the emissions trade, if any.

e. The provisions in the implementation plan that provide for the emissions trade with which the source will comply and any other information as may be required by the provisions in the implementation plan authorizing the trade.

f. If the emissions trading provisions of the implementation plan are invoked, then the permit requirements with which the source will comply.

g. Any permit term or condition that is no longer applicable as a result of the change.

XVII. TESTING REQUIREMENTS [A.A.C.R18-2-312]

A. Operational Conditions During Testing

Tests shall be conducted during operation at the normal rated capacity of each unit, while operating at representative operational conditions unless other conditions are required by the applicable test method or in this permit. With prior written approval from the Director, testing may be performed at a lower rate. Operations during start-up, shutdown, and malfunction (as defined in A.A.C. R18-2-101) shall not constitute representative operational conditions unless otherwise specified in the applicable standard.

B. Test Plan

At least 14 calendar days prior to performing a test, the owner or operator shall submit a test plan to the Director, in accordance with A.A.C. R18-2-312.B and the Arizona Testing Manual. This test plan must include the following:

1. test duration;
2. test location(s);
3. test method(s); and
4. source operation and other parameters that may affect test results.

C. Stack Sampling Facilities

Permittee shall provide or cause to be provided, performance testing facilities as follows:

1. Sampling ports adequate for test methods applicable to the facility;
2. Safe sampling platforms;
3. Safe access to sampling platforms; and
4. Utilities for sampling and testing equipment.

D. Interpretation of Final Results

Each performance test shall consist of three separate runs using the required test method. Each run shall be conducted in accordance with the applicable standard and test method. For the purpose of determining compliance with an applicable standard, the arithmetic means of results of the three runs shall apply. If a sample is accidentally lost or conditions occur which are not under the Permittee's control and which may invalidate the run, compliance may, upon the Director's approval, be determined using the arithmetic mean of the other two runs.

E. Report of Final Test Results

A written report of the results of all performance tests shall be submitted to the Director within 30 days after the test is performed. The report shall be submitted in accordance with the Arizona Testing Manual and A.A.C. R18-2-312.A.

F. Cessation of Testing After the First Run has Started

If the Director or the Director's designee is not present, tests may only be stopped for good cause. Good cause includes, forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions or other conditions beyond the Permittee's control. Termination of any test without good cause after the first run is commenced shall constitute a failure of the test. Supporting documentation which demonstrates good cause must be submitted.

XVIII. PROPERTY RIGHTS [A.A.C. R18-2-306.A.8.d]

This permit does not convey any property rights of any sort, or any exclusive privilege.

XIX. SEVERABILITY CLAUSE [A.A.C. R18-2-306.A.7]

The provisions of this permit are severable. If any provision of this permit is held invalid, the remainder of this permit shall not be affected thereby.

XX. PERMIT SHIELD [A.A.C. R18-2-325]

Compliance with the conditions of this permit shall be deemed compliance with the applicable requirements identified in Attachment "C" of this permit. The permit shield shall not apply to any changes made pursuant to Section XV.B of this Attachment and Section XVI of this Attachment.

ATTACHMENT "B": SPECIFIC CONDITIONS

Air Quality Control Permit No. 1000383
For
Yarnell Mining Company

I. RELATIONSHIP OF PERMIT TO APPLICABLE STATE IMPLEMENTATION PLAN

This permit is issued pursuant to the provisions of A.R.S. §49-404.C and §49-426 and constitutes an installation permit for the purpose of the applicable State Implementation Plan.

II. APPLICABLE REQUIREMENTS

A. REFERENCE TO AND CITATION OF APPLICABLE REQUIREMENTS [A.A.C. R18-2-306.A.2.a.]

This permit specifies and references the origin of and authority for each term or condition and identifies any differences in form as compared to the applicable requirement upon which the term or condition is based.

B. LIST OF APPLICABLE REQUIREMENTS

Arizona Administrative Code (A.A.C.)

Article 6. Emissions from Existing and New Nonpoint Sources
- R18-2-604, Open areas, dry washes or riverbeds
- R18-2-605, Roadway and streets
- R18-2-606, Material handling
- R18-2-607, Storage piles
- R18-2-610, Evaluation of nonpoint source emissions

Article 7. Existing Stationary Source Performance Standards
- R18-2-702, General Provisions
- R18-2-719, Standards of performance for existing stationary rotating machinery
- R18-2-730, Standards of performance for unclassified sources

Article 8. Emissions from Mobile Sources (New and Existing)
- R18-2-802, Off-road machinery

Article 9. New Source Performance Standards
- R18-2-901.1, Subpart A - General Provisions (40 CFR Part 60, Subpart A - General Provisions, incorporated by reference
- R18-2-901.41, Subpart LL - Metallic Mineral Processing Plants (40 CFR Part 60, Subpart LL - Standards of Performance for Metallic Mineral Processing Plants, incorporated by reference)
- R18-2-902, General Provisions
- R18-2-905, Standards of performance for storage vessels for petroleum liquids

III. EMISSION LIMITATIONS

A. PARTICULATE EMISSIONS

1. Process Fugitive Emissions From Affected Facilities [A.A.C. R18-2-901.41]

Affected facilities which emit process, fugitive emissions, in accordance with A.A.C. 901.41, Subpart LL (40 CFR 60,

Subpart LL) include, any emission points along crushing/screening circuit, conveyor transfer points and the haul truck unloading station at the primary crusher.

On and after the sixtieth (60) day after achieving the maximum production rate at which an affected facility will be operated, but not later than 180 days after initial start-up, the permittee shall not cause or allow to be discharged into the atmosphere from the any affected facility any process, fugitive emissions that exhibit greater than 10 percent opacity. [This is a material permit condition.].

2. Other Point and Nonpoint Source Emissions [A.A.C. R18-2-610 and 702]

Opacity of visible emissions from other point and nonpoint sources shall not be greater than 40 percent.

3. Off-Road Machinery Emissions [A.A.C. R18-2-802]

The permittee shall not cause or allow emissions of smoke into the atmosphere from any off-road machinery (e.g. trucks, graders, rollers, and other mining machinery not normally driven on a completed public roadway) for any period greater than ten (10) consecutive seconds that exceeds 40 percent opacity. Visible emissions when starting cold equipment shall be exempt from this requirement for the first ten (10) minutes.

B. HYDROGEN CYANIDE (HCN) EMISSIONS [A.A.C. R18-2-730]

The permittee shall not cause or allow hydrogen cyanide to be emitted from any location in such manner and amount that the concentration of such emissions into the ambient air at any occupied place beyond the premises on which the source is located exceeds 0.3 parts per million by volume for any averaging period of eight (8) hours.

C. SODIUM CYANIDE (NaCN) EMISSIONS [A.A.C. R18-2-730]

The permittee shall not cause or allow sodium cyanide dust or dust from any other solid cyanide to be emitted from any location in such a manner and amount that the concentration of such emissions into the ambient air at any occupied place beyond the premises on which the source is located exceeds 140 $\mu g/m^3$ for any averaging period of eight (8) hours.

D. GENERATOR EMISSIONS [A.A.C. R18-2-719]

1. The permittee shall not cause or allow the discharge of particulate matter into the atmosphere from the diesel generators in excess of the following:

$$E = 1.02Q^{0.769}$$

where:

E = the maximum allowable particulate emissions rate in lbs/hr.
Q = the heat input in MMBTU/hr.

2. The permittee shall not cause or allow the discharge of sulfur dioxide into the atmosphere from the diesel generators in excess of 1.0 lb/MMBTU heat input.

3. The permittee shall not cause or allow the discharge of smoke into the atmosphere from the diesel generators which exceeds 40 percent opacity for any period greater than ten (10) consecutive seconds. Visible emissions when starting cold shall be exempt from this requirement for the first ten (10) minutes.

E. LIME SILO EMISSIONS [A.A.C. R18-2-702 and -730]

1. The permittee shall not cause or allow the discharge of particulate matter into the atmosphere from the lime silo in excess of the following:

$$E = 4.10P^{0.67}$$

where:

E = the maximum allowable particulate emissions rate in lbs/hr.
P = the process weight in tons/hr.

2. The permittee shall not cause or allow the discharge of gases into the atmosphere from the lime silo which exceed 40 percent opacity as measured by EPA reference Method 9, 40 CFR 60, Appendix A.

F. CARBON KILN AND DORÉ FURNACE [A.A.C. R18-2-702 and -730]

1. The permittee shall not cause or allow the discharge of particulate matter into the atmosphere from the carbon kiln and Doré furnace in excess of the following:

$$E = 4.10P^{0.67}$$

where:

E = the maximum allowable particulate emissions rate in lbs/hr.
P = the process weight in tons/hr.

2. The permittee shall not cause or allow the discharge of SO_2 and NO_x into the atmosphere from the carbon kiln and Doré furnace in excess of the following:

a. sulfur dioxide - 600 ppm; and

b. nitrogen oxides - 500 ppm.

3. The permittee shall not cause or allow the discharge of gases into the atmosphere from the carbon kiln and doré furnace which exceeds 40 percent opacity as measured by EPA reference Method 9, 40 CFR 60, Appendix A.

IV. OPERATIONAL REQUIREMENTS

A. CONTROL OF FUGITIVE DUST EMISSIONS

1. Open Areas [A.A.C. R18-2-604]

The permittee shall not cause or allow construction, blasting, and movement of earth without taking reasonable precautions to limit excessive amounts of particulate matter from becoming airborne.

2. Roadway and Streets [A.A.C. R18-2-605]

The permittee shall not cause or allow the transportation of materials likely to result in airborne dust without taking reasonable precautions to minimize particulate matter from becoming airborne.

3. Material Handling [A.A.C. R18-2-606]

The permittee shall not cause or allow the crushing, screening, handling, transporting, or conveying of materials without taking reasonable precautions to prevent excessive amounts of particulate matter from becoming airborne.

4. Storage Piles [A.A.C. R18-2-607]

The permittee shall not cause or allow the stacking of materials without taking reasonable precautions to prevent excessive amounts of particulate matter from becoming airborne. Stacking and reclaiming machinery shall be operated at all times with a minimum fall of material and in such a manner as to prevent excessive amounts of particulate matter from becoming airborne.

For the above requirements, reasonable precautions include, but are not limited to: application of chemical dust suppressants, wetting, paving, covering, detouring, and barring access.

B. CONTROL OF FUGITIVE VOLATILE ORGANIC COMPOUND (VOC) EMISSIONS [A.A.C. R18-2-730]

1. The permittee shall process, store, use, and transport solvents or other volatile compounds, paints, and alkalies in such a manner and by such means that they will not evaporate, leak, escape, or otherwise be discharged into the atmosphere so as to cause or contribute to air pollution. Where means are available to effectively reduce the contribution to air pollution, such controls will be mandatory.

2. The permittee shall not emit gaseous or odorous materials from equipment, operations or premises under his control in such quantities or concentration as to cause air pollution.

C. AIR POLLUTION CONTROL

1. Processing Equipment

a. The permittee shall utilize water sprays during times of operation of the primary and secondary crushers, screens, conveyor systems, transfer points, and storage piles at the stacker discharge points. The water shall be applied at a rate sufficient to prevent excessive amounts of particulate from becoming airborne.

b. The permittee shall, prior to start-up, install a fabric filter on the lime silo in such manner as to collect the particulate matter emitted during the silo loading process. This fabric filter shall be installed, operated and maintained in accordance with the manufacturer's specifications.

c. The permittee shall, prior to start-up, install a baghouse on the carbon kiln and doré furnace in such manner as to collect the particulate matter from these sources. This baghouse shall be installed, operated and maintained in accordance with the manufacturer's specifications.

2. Unpaved Roads

The material requirements in this condition are designed to reduce fugitive dust from the unpaved roads by 90 percent. This shall be accomplished by applying water at the application intensity and frequency specified in the table shown below for each road segment. The application intensity can be decreased if the frequency is increased and visa versa. Also, the required application intensity and frequency may be decreased or eliminated during wet or freezing weather conditions.

Road Segment	Application Intensity gallons/square yard	Application Frequency hours
Haul Road - pit to junction	0.53	every 4
Haul Road - junction to crusher	0.44	every 4
Haul Road - junction to beginning of north waste dump	0.15	every 4
Haul Road - within north waste dump	0.15	every 4
Haul Road - crusher to south waste dump	0.17	every 4
Haul Road - crusher to leach pad	0.27	every 4
Service Road - property boundary to Adsorp-tion Desorption Refining (ADR) Plant	0.15	every 4

If in the Department's judgement the water application intensities shown above do not achieve the goal of 90 percent dust control, the permittee shall apply magnesium chloride ($MgCl_2$) or equivalent chemical dust suppressant or increase the water application intensity appropriately to segments of the unpaved roads identified by the Department. If $MgCl_2$ is utilized, the permittee shall treat the unpaved roadways monthly with the chemical dust suppressant. The magnesium chloride application intensity shall be at least 1.34 pounds per square yard dissolved in water for application. Additionally, water shall be applied frequently enough to maintain the integrity of the chemically treated surface and assure compliance.

If the permittee can demonstrate that the application frequency of either water or chemical suppressant can be extended without reducing the control efficiency below 90 percent, with written approval by the Department, the application frequency may be extended appropriately. The alternative control method using a dust suppressant as prescribed instead of water can be employed by the permittee at their discretion.

The permittee shall maintain records for each road segment showing the time of day and date of each treatment. Also, for water, the application intensity and for chemical dust suppression, the type and quantity of chemical suppressant utilized shall be recorded.

Permittee shall use appropriate means, such as berms, signs or other effective procedures, to restrict traffic usage to the treated areas. Should there be a rock spill on a roadway such that traffic is blocked, permittee shall clean up the spill; under no circumstances is traffic to be diverted to untreated areas to avoid the spill.

Permittee may discontinue spraying roads with water during freezing weather if doing so renders a dangerous surface.

3. Blasting/Drilling

The permittee shall equip blast hole drills with a combination of water injection, a pneumatic flushing device, and/or a dust shroud in order to control particulate emissions from drilling blast holes.

4. Liquid Petroleum Storage [A.A.C. R18-2-905]

a. The permittee shall install a submerged filling device or equivalent as determined by the Director on any storage tank of less than 40,000-gallon capacity.

b. The permittee shall provide for submerged filling or the equivalent as determined by the Director for the loading of petroleum products having a vapor pressure of 2.0 pounds per square inch absolute or greater.

c. The permittee shall equip all associated pumps and compressors with mechanical seals or the equivalent.

5. Sodium Cyanide (NaCN) Storage

The permittee shall ensure that sodium cyanide on the premises is contained in metal flow bins, double-lined boxes, and/or is delivered as an aqueous solution.

6. Hydrogen Cyanide (HCN) Emissions

The permittee shall maintain the leach solution pH at or above 10.5 to reduce fugitive emissions of HCN from the leach pad and processing circuit.

V. OPERATIONAL LIMITATIONS

A. MINING AND ORE PROCESSING SCHEDULES

1. The permittee shall limit the amount of ore that is processed through the crushing circuit to 15,600 tons per day and 1,200,000 tons per year, determined on a rolling 12-month total.

2. The permittee shall limit the mining and associated earth moving operations to 6,240 hours per year. There are no time restrictions on the leaching, solution processing and associated operations.

B. POWER GENERATION SCHEDULES

The permittee shall operate only one (1) of the two (2) 365 kW generators at any given time. The permittee may operate the 820 kW generator at the crushers continuously.

C. FUEL TYPE

The permittee shall burn only no. 2 diesel fuel with a sulfur content of less than 0.05 percent by weight in the generators and off-road machinery. Verification of the sulfur content shall be either by the supplier's analysis or, if requested by the Department, by ASTM D 2880-71 or an alternate method approved by the Department.

VI. PUBLIC ACCESS RESTRICTIONS

The permittee shall define the limits of public access by enclosing the process area with a fence or a natural topographic barrier adequate to restrict public access and posted to identify the area as restricted. Before construction of the fence, a plot plan showing the proposed location of the fence and natural topographic barriers shall be submitted to the Department and written approval received.

VII. PERFORMANCE TESTS [A.A.C. R18-2-306.A.3, -311 and -312]

A. TESTING FREQUENCY

Within 60 days after achieving the maximum production rate, but no later than 180 days after initial start-up (as defined in A.A.C. R18-2-101.101), Permittee shall conduct or cause to be conducted a performance test (as required in A.A.C. R18-2-312) for particulate matter. Subsequent performance tests shall be performed bi-ennially thereafter. For each test the discharge from the fabric filter servicing the lime storage silo and the baghouse servicing the carbon kiln and the doré furnace shall be tested. The Department may require additional testing when deemed necessary based on site/operation inspections.

At such time, the permittee shall also conduct or cause to be conducted an initial opacity test on the primary crusher, secondary crusher and associated screening operations.

B. STACK TESTING FACILITIES

Permittee shall provide, or cause to be provided, performance testing facilities as follows:

1. Sampling ports adequate for the applicable test methods;

2. Safe sampling platforms;

3. Safe access to sampling platforms; and

4. Utilities for sampling and testing equipment.

C. PROCESS RATE DURING TESTING

The performance test shall conducted at a minimum of 95 percent of the permitted operating capacity. However, should this not be feasible, the performance test may be conducted at a lower rate upon receipt of prior written approval from the Department. This alternative testing process rate shall not be less than 80 percent nor greater than 100 percent of the permitted operating capacity. If testing is performed at a rate lower 80 percent, subsequent operation shall be restricted to the process input rate used during the testing period until a subsequent performance test establishes a higher process input rate.

D. OPERATIONAL CONDITIONS DURING TESTING

The performance test shall reflect representative operational conditions of the plant. Operations during start-up, shutdown, and malfunction (as defined in A.A.C. R18-2-101) shall not constitute representative operational conditions.

E. TESTING METHODS

The performance test shall be conducted and data reduced (as required by A.A.C. R18-2-312.B) in accordance with the following test methods and procedures contained in the Arizona Testing Manual or 40 CFR Part 60, Appendix A:

1. EPA Reference Method 9 shall be used to determine opacity from process emission sources. The procedures set forth in 40 CFR §60.11 shall be used to determine initial compliance; the minimum total time of observations shall be three hours (30 / six-minute averaging periods).

2. EPA Reference Method 9 and procedures in 40 CFR §60.386(b)(2) shall be used to determine opacity from process fugitive emissions.

3. EPA Reference Method 5 shall be used to determine the particulate matter concentration. The sampling time and sample volume for each run shall be at least 60 minutes and 31.8 dry standard cubic feet (dscf), respectively.

4. EPA Reference Method 6 shall be used to determine the SO_2 concentration.

5. EPA Reference Method 7 shall be used to determine the NO_x concentration.

F. TESTING PLAN

The Department shall be notified in writing at least 30 days prior to the performance test, and a pre-test meeting with the Department shall be arranged at least 14 calendar days prior to testing to allow time for the development of an appropriate testing plan and to arrange for an observer to be present at the test. Permittee shall submit a test plan to the Department at least seven (7) calendar days prior to the pre-test meeting. Such test plan shall be in accordance with the Arizona Testing Manual and must be approved, in writing, by the Department before the test is performed.

G. TESTING PROCEDURES

Permittee shall conduct three (3) separate test runs using the required test method. Each run shall be conducted in accordance with the applicable standard and test method. Except as provided for in A.A.C. R18-2-312.C, compliance with an applicable standard shall be determined based on the arithmetic mean of the results of the three (3) test runs. If a sample

is accidentally lost or conditions occur which are not under Permittee's control and which may invalidate the run, compliance may, upon the Director's approval, be determined using the arithmetic mean of the other two (2) runs. If the Director, or the Director's designee is present, tests may only be stopped with the Director's or such designee's approval. If the Director, or the Director's designee is not present, tests may only be stopped for good cause, which includes forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, or other circumstances beyond Permittee's control. Termination of testing without good cause after the first run is commenced shall constitute a failure of the test. Supporting documentation which demonstrates good cause must be submitted.

H. TEST FAILURE

1. Except as limited by 40 CFR §60.8(c) and A.A.C. R18-2-312.C, a performance test failure constitutes a violation of the applicable emission standard. According to A.R.S. §49-464.C, a person who knowingly operates a source in violation of an emission standard is guilty of a class 5 felony. If a performance test demonstrates an exceedance, Permittee shall follow the procedures outlined in this section. Adherence to such procedures does not relieve Permittee of any enforcement action resulting from a performance test failure. Ceasing operation of the emission unit(s) immediately after Permittee discovers the test failure may relieve Permittee of an enforcement action resulting from a violation of A.R.S. §49-464.C.

2. Except when A.A.C. R18-2-306.E or R18-2-310 applies, if Permittee discovers that a performance test indicates an exceedance either by direct examination of the preliminary test results or through notification by the Department, Permittee shall:

   a. Notify the Department by telephone or facsimile as soon as practical after Permittee's discovery that the preliminary test results indicate an exceedance; and

   b. Immediately after discovery, take all necessary measures to ensure that the applicable emission standard is met. At the direction of the Department, necessary measures may include ceasing or reducing operations, immediately repairing equipment, and/or other measures which will ensure that the emission standard will be met.

3. If Permittee continues to operate the emissions unit(s) after the test failure is documented, a complete re-test shall be completed as soon as practical, but no later than 48 hours after the appropriate measures have been completed. If a re-test continues to show a test failure, Permittee shall take additional measures and re-test within 48 hours of the completion of any additional measures until a performance test demonstrates compliance with the emission standard or the Department determines that the unit(s) shall be shut down for a detailed investigation of the problem. Re-testing does not relieve Permittee from further enforcement action, which may include a temporary restraining order issued pursuant to A.R.S. §49-462.

4. If Permittee continues to operate the emission unit(s) after the test failure is documented, a compliance schedule shall be submitted to the Department as soon as practical, but no later than 48 hours after discovery, which includes the following:

   a. A sequential list of all actions and measures taken or to be taken to achieve compliance, indicating those actions and measures that the permittee considers to be significant;

   b. Deadlines for completion of each significant action;

   c. Deadlines for submitting progress reports and a test plan;

   d. Deadlines for performing a second test; and

   e. A certification of truth, accuracy, and completeness from a responsible official.

5. If any significant deadline listed in the compliance schedule is not met, Permittee shall submit a revised compliance schedule which includes an explanation of why any significant dates in the previous schedule were not met.

I. REPORTING OF TEST RESULTS

Permittee shall submit a written report of the results of all performance tests to the Director within 30 calendar days after the test is performed. The report shall be submitted in accordance with the Arizona Testing Manual and A.A.C. R18-2-312.B.

VIII. OPERATION AND MAINTENANCE PLAN

Permittee shall submit to the Department, at least 30 days before commencing operations, an Operation and Maintenance Plan describing the actions and procedures that will be followed in order to achieve and maintain compliance with the conditions of this permit. The plan should include recordkeeping mechanisms, e.g., check lists, that will be used to track compliance with the plan. Upon receiving written approval from the Department, permittee shall implement this plan.

IX. RECORDKEEPING REQUIREMENTS [A.A.C. R18-2-306.A.4]

A. The permittee shall retain records of all required recordkeeping data and support information for a minimum period of five (5) years after the date of recording. These records shall be made available for inspection during reasonable hours at the request of an ADEQ representative.

B. The permittee shall maintain records of the following:

1. all performance test data required for compliance certification (see VII); and

2. the daily amount of ore processed and the monthly totals with the year-to-date total, i.e., the sum of the current month and the previous eleven (11) months;

3. the daily hours of operation and the monthly totals with the year-to-date total, i.e., the sum of the current month and the previous eleven (11) months;

4. the test reports or vendor specifications for the diesel fuel sulfur content;

5. the date of each drilling operation and the control method applied;

6. the date, time and intensity of each application of water or chemical dust suppressant to roadways (designate portion being treated), waste piles and ore storage piles;

7. measure and record the pH of the barren solution at the heap leach facility daily; if an adjustment is made, record the types of chemicals added and the amount;

8. the delivery dates for the NaCN and the method of containment as delivered and stored; and

9. accountability as to compliance with the Operation and Maintenance Plan

C. Permittee shall maintain a State of Arizona certified opacity observer on site at all times to certify compliance with opacity standards listed in this attachment, Section III. The observer shall enter all violations in a permanent record and sign that record daily to attest to its accuracy to the best of his/her knowledge. All violations of an opacity standard stated in this permit shall be reported as a permit deviation, Attachment "A", Section XII.

X. REPORTING REQUIREMENTS [A.A.C. R18-2-306.A.5 and 309.A.3]

A. Records of the daily amounts of ore processed through the crushing circuit and the daily hours of operation and the respective monthly totals shall be submitted annually.

B. The permittee shall submit reports of any required monitoring (recordkeeping data) at least every six (6) months. All instances of deviations from permit requirements shall be clearly identified in such reports.

C. The permittee shall promptly report deviations from permit requirements, including those attributable to upset conditions. The report shall include the cause of such deviations and any corrective actions or preventative measures taken.

D. The permittee shall ensure that any document (including reports) required to be submitted by this permit is certified as being true, accurate, and complete by a responsible corporate official.

E. The permittee shall notify the Department in writing within 30 days of placing an order for or purchasing the equipment listed in Attachment "C". The notification shall include all information necessary to complete Attachment "C".

ATTACHMENT "C": EQUIPMENT LIST

Air Quality Control Permit No. 1000383
For
Yarnell Mining Company

Type of Equipment	Manufacturer	Model No.	Serial No.	Manufacture Date	Equipment ID No.
Feed Hopper (70-Ton Capacity)	TBD	TBD	TBD	TBD	C101
Vibrating Grizzly Feeder	TBD	TBD	TBD	TBD	C102
Primary Jaw Crusher (650 TPH Capacity) w/ Associated Conveyors	TBD	TBD	TBD	TBD	C103
Double-Deck Screen	TBD	TBD	TBD	TBD	C104
Secondary Cone Crusher (650 TPH Capacity) w/ Associated Conveyors	TBD	TBD	TBD	TBD	C105
365 kW Diesel-Fired Generator	TBD	TBD	TBD	TBD	GA
365 kW Diesel-Fired Generator	TBD	TBD	TBD	TBD	GB
820 kW Diesel-Fired Generator	TBD	TBD	TBD	TBD	G1
113 kW Diesel-Fired Generator, at water supply well*	TBD	TBD	TBD	TBD	G2
25 kW Diesel-Fired Generator, at water supply well*	TBD	TBD	TBD	TBD	G3
5 - 6 kW Diesel Powered Light Plants*	TBD	TBD	TBD	TBD	L 1-5
Carbon Stripping Heater	TBD	TBD	TBD	TBD	P201
Carbon Regeneration Kiln	TBD	TBD	TBD	TBD	P202
Propane-Fired Doré Furnace (1.2 MMBTU/hr)	TBD	TBD	TBD	TBD	P203
Diesel Storage Tank (10,000 Gal. Capacity)	TBD	TBD	TBD	TBD	FA
Diesel Storage Tank (10,000 Gal. Capacity)	TBD	TBD	TBD	TBD	FB
Gasoline Storage Tank (5,000 Gal. Capacity)	TBD	TBD	TBD	TBD	FC

* - permit not required.

TBD - to be determined; complete equipment information will be provided as it becomes available.